3GPP TSG RAN Meeting #71
Göteborg, Sweden, March 7 - 10, 2016

RP-160676
revision of RP-160639

Source:	**Huawei, HiSilicon**
Title:	**New WI proposal: SRS Carrier Based Switching for LTE**
Document for:	**Decision**
Agenda Item:	**10.1.1**

3GPP™ Work Item Description

For guidance, see 3GPP Working Procedures, article 39; and 3GPP TR 21.900.
Comprehensive instructions can be found at http://www.3gpp.org/Work-Items

---

Title: SRS Carrier based Switching for LTE

Acronym: LTE_SRS_CS

Unique identifier:

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	**x**
This WID includes a Performance part	**x**

1 3GPP Work Area

X	**Radio Access**
	Core Network
	Services

2 Classification of WI and linked work items

2.0 Primary classification

This work item is a …

	Study Item (go to 2.1)
X	**Feature (go to 2.2)**
	Building Block (go to 2.3)
	Work Task (go to 2.4)

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks. If you are in doubt, please contact MCC.

2.1 Study Item

Related Work Item(s) (if any]		
Unique ID	**Title**	**Nature of relationship**

Go to §3.

2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	**Title**	**Nature of relationship**

Go to §3.

2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	**Title**	**TS**

This work item is …

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

2.3.1 Stage 1

Source of external requirements (if any)		
Organization	**Document**	**Remarks**

Go to §3.

2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	**Title**	**TS**

Other source of stage 1 information		
TS or CR(s)	**Clause**	**Remarks**

If no identified source of stage 1 information, justify:

Go to §3.

2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	**Title**	**TS**

Else, corresponding stage 1 work item		
Unique ID	**Title**	**TS**

Other justification		
TS or CR(s) or external document	**Clause**	**Remarks**

If no identified source of stage 2 information, justify:

Go to §3.

2.3.4 Test spec

Related Work Item(s)		
Unique ID	**Title**	**TS**

Go to §3.

2.3.5 Other

Related Work Item(s)			
Unique ID	**Title**	**Nature of relationship**	**TS / TR**

Go to §3.

2.4 Work task

Parent Building Block		
Unique ID	**Title**	**TS**

3 Justification

In LTE networks, there are many kinds of downlink heavier traffic, which leads to more number of aggregated downlink component carriers (CC) than the number of (aggregated) uplink CCs. For the existing UE categories, the typical CA capable UEs only support one or two uplink CCs.

For the carrier supporting both uplink and downlink, transmit diversity based feedback without PMI and with SRS is beneficial as channel reciprocity can be used. However, UE generally has the capability of aggregating larger number of DL carriers than that in the UL. As a result, some of TDD carriers with DL transmission for the UE will have no UL transmission including SRS, and channel reciprocity cannot be utilized for these carriers. Such situations will become more severe with CA enhancement of up to 32 CCs where a large portion of CCs are TDD. Allowing fast carrier switching to and between TDD UL carriers can be a solution to allow SRS transmission on these TDD carriers and should be supported.

4 Objective

4.1 Objective of SI or Core part WI or Testing part WI

The WI is to specify enhancements for networks operating with CA. The objectives of the WI are:

- To support SRS switching to and between TDD component carrier(s), where the component carriers available for SRS transmission correspond to the component carriers available for carrier aggregation of PDSCH, while the UE has fewer component carriers available for carrier aggregation of PUSCH [RAN1, RAN2, RAN4]
- Corresponding UE and eNB core requirements [RAN4].

4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

- Specify the necessary (if any) UE and eNodeB performance requirements for SRS carrier based switching for the scenarios addressed in RAN1 and RAN2 specifications.

4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables):
Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field.
If no time unit is needed, leave the field empty.
Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #71									**Q2/2016**									**RAN #72**	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79
1						**0.5**	**0.5**			**1**						**0.5**	**0.5**		

RAN #72 Q3/2016 RAN #73									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
86	86	94	94	94	93	80	80	80	80
1						**0.5**	**0.5**		

RAN #73									**Q4/2016**									**RAN #74**	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
86bis	86bis	94bis	94bis	94bis	93bis	80bis	80bis	80bis	80bis	87	87	95	95	95	94	81	81	81	81
1		**0.5**				**0.5**	**0.5**	**0.5**	**0.5**	**1**		**0.5**				**0.5**	**0.5**	**0.5**	**0.5**

RAN #74 Q1/2017 RAN #75									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf

88	88	96	96	96	95	82	82	82	82
								0.5	**1**

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

additional comments to the time budget proposal:

5 Service Aspects

6 MMI-Aspects

7 Charging Aspects

8 Security Aspects

9 Impacts

Affects:	**UICC apps**	**ME**	**AN**	**CN**	**Others**
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation	RAN#74	Core Part
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding	RAN#74	Core Part
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures	RAN#74	Core Part
36.214		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements	RAN#74	Core Part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#74	Core Part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#74	Core Part
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification	RAN#74	Core Part
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#74	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#74	Core Part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#74	Core Part
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#74	Core Part
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#74	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#75	Performance Part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#75	Performance Part

36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#75	Performance Part
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#75	Performance Part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

11 Work item rapporteur(s)

Weimin Xiao
Company: Huawei
Email: weimin [dot] xiao [at] huawei [dot] com

12 Work item leadership

RAN WG1 primary
RAN WG2 WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.
RAN WG4 is by default leading the Perf. part.

13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
Telefonica
IAESI
Potevio
Coolpad
III
Telus
CATR
China Unicom
SoftBank Mobile
CATT
Teliasonera
Orange
CMCC
Lenovo
OPPO
US Cellular
Motorola Mobility